THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 9

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte NEIL E. GOODZEIT
and
MICHAEL A. PALUSZEK

Appeal No. 95-0550
Application 07/897,489[1]

ON BRIEF

Before, HAIRSTON, JERRY SMITH and FLEMING, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

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[1] Application for patent filed June 12, 1992.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1-18, which constitute all the claims in the application.

The claimed invention pertains to an apparatus and method for controlling the attitude of a spacecraft about at least one axis. More specifically, high frequency components of attitude derived from wheel speed sensed signals are combined with low frequency components of attitude derived from an attitude sensing means. This composite signal is disclosed as containing less noise than conventionally used control signals.

Representative claim 1 is reproduced as follows:

1. A spacecraft attitude control system, comprising:

a wheel mounted to said body, said wheel defining an axis of rotation;

wheel speed sensing means coupled to said wheel, for generating wheel speed signals;

torquing means mounted to said body, for controllably applying torque to said body about said axis in response to torque command signals:

attitude determining means coupled to said body for generating determined attitude signals;

control means coupled to said torquing means, and for receiving coupled attitude position signals and coupled attitude

rate signals, for comparing said coupled attitude position signals with commanded attitude position signals to generate attitude error signals, and for combining said attitude error signals with said coupled attitude rate signals for generating said torque command signals;

coupling means coupled to said attitude determining means, to said control means, and to said wheel speed sensing means, for processing said wheel speed signals to produce wheel-derived signals related to one of attitude position and attitude rate, and for combining portions of said wheel-derived signals lying above a particular frequency with portions of said determined attitude signals lying below said particular frequency to generate one of said coupled attitude position and coupled attitude rate signals, and for generating the other one of said coupled attitude position and coupled attitude rate signals from one of said determined attitude signals and said one of said coupled attitude position and said coupled attitude rate signals.

The examiner relies on the following references:

Paluszek	5,107,434	Apr. 21, 1992
Stetson, Jr. (Stetson)	5,205,518	Apr. 27, 1993 (filed Nov. 25, 1991)

Claims 1-18 stand rejected under 35 U.S.C. § 103. As evidence of obviousness the examiner offers Stetson and Paluszek taken together.

Rather than repeat the arguments of appellants or the examiner, we make reference to the brief and the answer for the respective details thereof.

OPINION

We have carefully considered the subject matter on appeal, the rejection advanced by the examiner and the evidence of obviousness relied upon by the examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellants' arguments set forth in the brief along with the examiner's rationale in support of the rejection and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the collective evidence relied upon and the level of skill in the particular art would not have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims 1-18. Accordingly, we reverse.

Appellants have argued the claims in two separate groupings as follows: Group I contains claims 1-16 and Group II contains claims 17 and 18. Appellants have made no separate arguments with respect to the claims within each group so that all the claims within any one group will stand or fall together. Note In re King, 801 F.2d 1324, 1325, 231 USPQ 136, 137 (Fed. Cir. 1986); In re Sernaker, 702 F.2d 989, 991, 217 USPQ 1, 3

(Fed. Cir. 1983). Accordingly, we will only consider the rejection against claims 1 and 17 as representative of all the claims on appeal.

With respect to claims 1 and 17, the examiner essentially applies the rejection in the following manner. Stetson teaches combining a wheel speed derived attitude signal (from block 312) with a signal directly from an attitude sensing means (from block 16) to derive an attitude control signal. Stetson does not teach filtering these signals for noise reduction. Paluszek teaches that two attitude related signals can be combined in a manner that takes into account the sources of noise in the respective signals. It is the position of the examiner that these two teachings would have suggested to the artisan the obviousness of combining signals in the manner recited in claims 1 and 17 [answer, pages 4-5 and 7-9]. Appellants argue that the applied references do not teach the specific claimed relationship of using the wheel speed signals in one particular frequency range with attitude sensor signals lying in a different frequency range. We find ourselves in agreement with appellants on this point.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988) and compare Stratoflex Inc. v. Aeroquip Corp., 713 F.2d 1530, 1535, 218 USPQ 871, 876 (Fed. Cir. 1983). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re

Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1446 (Fed. Cir. 1992).

At first blush, the examiner's position appears quite logical and her conclusion seems to be sound. The problem with the rejection, however, is that it relies on very general teachings to support the obviousness of fairly specific claim recitations. There is no dispute that the prior art teaches that attitude signals of a spacecraft can be derived from wheel speed sensors on the spacecraft as well as attitude determining means such as an earth sensing means. There is also no dispute that the prior art teaches that two signals representative of spacecraft attitude can be combined taking into account the noise characteristics of the respective sources. The real issue here is the obviousness of specifically selecting the high frequency components of the wheel speed signals and the low frequency components of the attitude sensor components for combination.

The examiner's position assumes that the artisan not only knows what two signals to combine, but also that he knows exactly how these two signals each contributes to the overall noise of the composite signal. This position is unsupported by the evidence of record in this case. The very thrust of

appellants' invention lies in the recognition that the high frequency wheel speed signals should be used along with the low frequency attitude sensor signals. Neither of the applied references recognizes in what manner the wheel speed signals contribute noise and, therefore, in what manner the signals should be filtered.

The examiner's position is tantamount to holding that every way of filtering two combined signals in a spacecraft attitude control means would have been obvious to the artisan from the general concept because it would increase the stability of the system. There must be at least one additional teaching here that combining only the high frequency components of the wheel speed signals with the low frequency components of an attitude sensor would be an obvious thing to do. The only suggestion for combining these signals in the specific claimed manner comes from appellants' own specification.

The mere fact that the prior art may be modified in the manner suggested by the examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992); In re Gordon, 733 F.2d 900, 902,

221 USPQ 1125, 1127 (Fed. Cir. 1984). Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor. Para-Ordnance Mfg. Inc. v. SGS Importers Int'l Inc., 73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995). In our view, the claimed recitation of selecting only the high frequency components of the wheel speed signals and only the low frequency components of the attitude sensor signals comes from a suggestion appearing only in appellants' disclosure and not in the applied prior art.

In view of our comments above, we do not sustain the rejection of claims 1-18 based upon the prior art applied by the examiner. Accordingly, the decision of the examiner rejecting claims 1-18 is reversed.

REVERSED

KENNETH W. HAIRSTON)
Administrative Patent Judge)
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JERRY SMITH) BOARD OF PATENT
Administrative Patent Judge) APPEALS AND
) INTERFERENCES
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